GENERAL ATOMIC DIVISION
GENERAL DYNAMICS CORPORATION

John Jay Hopkins Laboratory
for Pure and Applied Science

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RADIATION EFFECTS ON SILICON SOLAR CELLS

Ninth Monthly Progress Report Covering
the Period
November 1 - 30, 1962

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This ninth monthly report on Contract No. NAS7-91, Radiation Effects in Silicon Solar Cells, covers the period November 1 through 30, 1962. Approval has been received to continue the research period through December 31, 1962 rather than November 30, as originally scheduled. In view of this change, this report is being submitted as a monthly report rather than a quarterly. The last four months of research, together with periods covered in the three previous quarterly reports, will be the subject of a final report submitted in January, 1963.

During this period experimental measurements on galvanomagnetic coefficients and minority carrier lifetimes in irradiated silicon have been continued. Experiments with p-type silicon have been performed after successful development of techniques for placing non-rectifying contacts on this material. Irradiations have also been performed with 5-Mev electrons for comparison with the previous 30-Mev irradiations.

The preliminary electron spin resonance experiments are in agreement with the results of the other three techniques (galvanomagnetic, lifetime and infrared absorption) in that no A centers were found in quartz crucible grown n-type silicon irradiated with 30-Mev electrons. It appears quite conclusive that the more clustered type of damage produced by the high-energy electrons does not lead to A center production as effectively as the lower energy irradiations. This conclusion should carry over also to irradiation by high energy protons because in this case the clustered type of damage should also be produced. It now becomes necessary to establish in detail the nature of the defects which are produced by the higher energy clustering irradiation. The galvanomagnetic and lifetime experiments have already given evidence about the energy level and cross sections of these defects. Further analyses of these results, together with the results of the p-type experiments, will be performed for the final report.

The semi-automatic film reading system has been used to encode the results of all the semiconductor lifetime experiments. The computer program for analyzing these data has been checked out and all of the previous lifetime data are in the process of reduction to final form by this computer program.

The following personnel have spent the indicated fraction of their

time on this research program during this reporting period:

0 - 10%	R. Denson
	R. F. Goff
	H. Gomez
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